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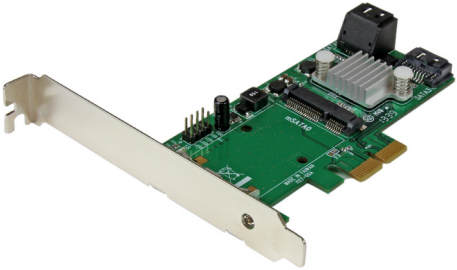
1x mSATA + 3x SATA PCIe SATA III 6Gbps RAID Controller Card

PEXMSATA343



*actual product may vary from photos

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Manual Revision: 08/13/2014

FCC Compliance Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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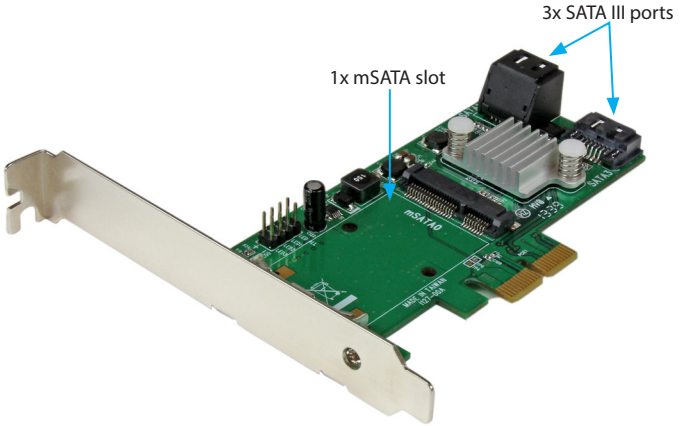
Product Overview



LED and PIN Header LED

LED / Header	Status
mSATA - Green LED	**On:** Drive is linked **Blinking:** Accessing the drive
SATA LED 0-3 - Pin Headers	**On:** Drive is linked **Blinking:** Accessing the drive
LED All - Pin Header	**On:** When any one of the 4 drives is linked **Blinking:** When any one of the 4 drives is accessing

Installation

mSATA SSD Installation

WARNING!

SSD Drives and storage adapters require careful handling. If you are not careful with your SSD Drive, lost data may result. Always handle your drive with caution. Be sure that you are properly grounded by wearing an anti-static strap when handling computer components or discharge yourself of any static electricity build-up by touching a large grounded metal surface (such as the computer case) for several seconds.

1. Slide the mSATA connector on your SSD into the mSATA reciprocal connector on the PEXMSATA343
2. Gently press the drive down toward the metal mounting bracket clip, until the drive clicks into place. The SSD has now been installed.

Note: To remove your SSD pull upward on the metal tabs located near the top of the drive, then slide the drive out.

Hardware Installation

WARNING! PCI Express cards, like all computer equipment, can be severely damaged by static electricity. Be sure that you are properly grounded before opening your computer case or touching your PCI Express card. StarTech.com recommends that you wear an anti-static strap when installing any computer component. If an anti-static strap is unavailable, discharge yourself of any static electricity build-up by touching a large grounded metal surface (such as the computer case) for several seconds. Also be careful to handle the PCI Express card by its edges and not the gold connectors.

1. Turn your computer off and any peripherals connected to the computer (i.e. Printers, external hard drives, etc.). Unplug the power cable from the rear of the power supply on the back of the computer and disconnect all peripheral devices.
2. Remove the cover from the computer case. See documentation for your computer system for details.
3. Locate an open PCI Express x2 slot and remove the metal cover plate on the rear of the computer case (Refer to documentation for your computer system for details).

NOTE: This card will work in PCI Express slots of additional lanes (i.e.x4, x8, or x16 slots).

4. Gently insert the card into the open PCI Express slot and fasten the bracket to the rear of the case.

NOTE: If installing the card into a small form factor/low profile system, replacing the pre-installed full profile bracket with the included low profile installation bracket may be necessary.

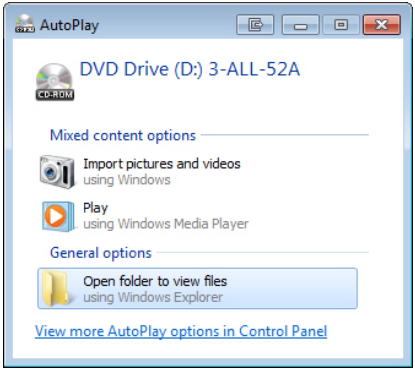
5. Connect SATA cables from the ports on the card to the SATA devices inside the computer.
6. Place the cover back onto the computer case.
7. Insert the power cable into the socket on the power supply and reconnect all other connectors removed in Step 1.

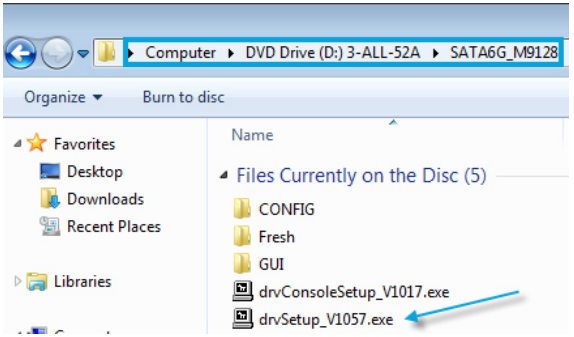
Driver Installation

Windows

Note: The card may auto-install using native drivers, however it is recommended to use the procedure below to update to the latest driver version.

1. Upon starting Windows, if the Found New Hardware dialog appears on the screen, cancel/close the window and insert the included Driver CD into the computer's CD/DVD drive.
2. If AutoPlay is enabled, select the "Open folder to view files" option when the dialog appears.
3. Run the "drvSetup_V1057.exe" application located in the "SATA6G_M9128" folder to start the installation process.





4. If AutoPlay is disabled, browse to your CD/DVD drive and open the "drvSetup_V1057.exe" application located in the "SATA6G_M9128" folder to start the installation process.
5. Follow any on-screen instructions to complete the software installation.

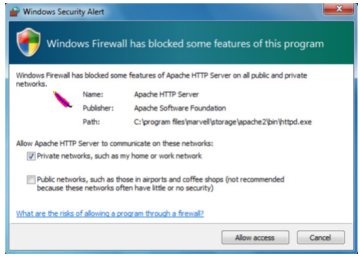
Note: You may be prompted to restart your system.

Management Utility Installation

RAID and/or HyperDuo configuration can be accomplished either through the integrated card-BIOS utility, or through the Marvell Storage Utility (MSU). Details for installing the MSU are below.

To install the Marvell Storage Utility (MSU) in Windows:

1. Run the "MSUSetup.exe" application located in the "SATA6G_M9128\GUI" folder and follow the on-screen instructions. Select "Next" and accept the license agreement when prompted – the default installation options are recommended.
2. After installing the Apache2 HTTP Server (which is a built-in component of the installation package), the installation may trigger a Windows Security Alert on some versions of Windows, please allow access.


Windows Security Alert
Windows Firewall has blocked some features of this program
Windows Firewall has blocked some features of Apache HTTP Server on all public and private networks.
Name: Apache HTTP Server
Publisher: Apache Software Foundation
Path: C:\program files\marvell\storage\apache2\bin\httpd.exe
Allow Apache HTTP Server to communicate on these networks:
Private networks, such as my home or work network
Public networks, such as those in airports and coffee shops (not recommended because these networks often have little or no security)
What are the risks of allowing a program through a firewall?
Allow access
Cancel

3. Before opening the MSU, verify that Active Scripting or JavaScript is enabled in the browser.

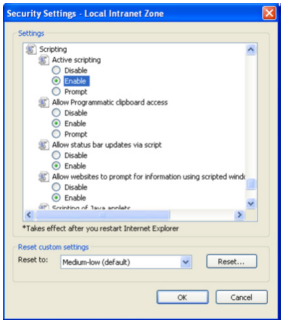
   a. Internet Explorer

      i. From the menu bar, select Tools > Internet Options.

      ii. Select the "Security" tab, then "Local Intranet", then "Custom level".

      iii. In the list of settings, scroll down to Scripting > Active scripting.

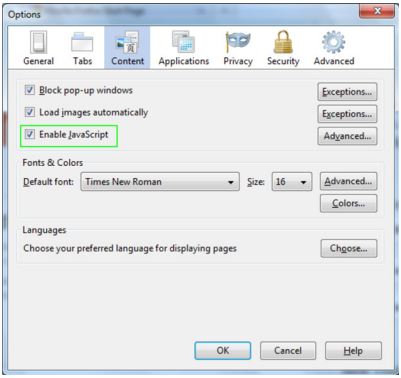
      iv. Select "Enable", then click "OK" to confirm the selection.



   b. Firefox

      i. From the menu bar, select Tools > Options

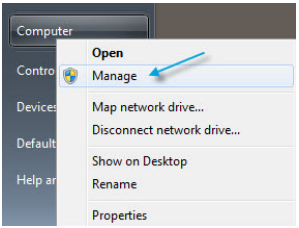
      ii. Select the "Content" tab and ensure that the "Enable Javascript" option is checked (should be by default) – if it is not, select it and click "OK"

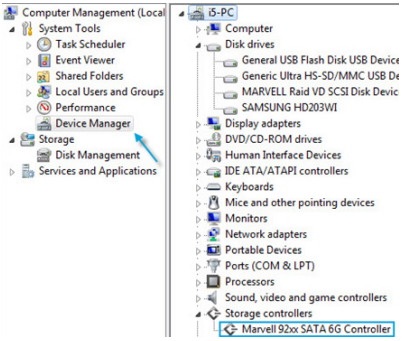


Verifying Installation

Windows

1. From the main desktop or start menu, right-click on "Computer" ("My Computer" in XP), then select "Manage."
2. In the new Computer Management window, select Device Manager from the left window panel.





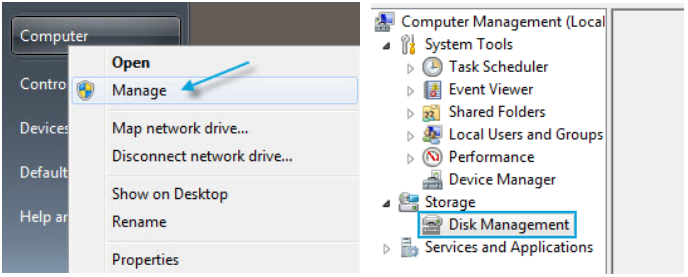
3. Under the "Storage Controllers" category ("SCSI and RAID Controllers" in XP) should be a "Marvell 92xx" device. Right-click on the device and select "Properties" to make sure it is installed and working correctly.

Note: After a successful installation, some users may notice a yellow icon next to "Marvell Console ATA Device" under the "Other Devices" category within the Device Manager. Device performance and operation is not affected by this notification. If you wish to remove this to icon, run the "drv Setup _V 1017.exe" application located in the "SATA6G_M9128" folder.

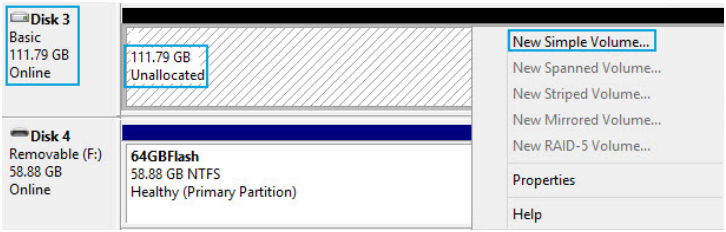
Hard Drive Initialization

If the mSATA SSD or SATA HDD is new or otherwise blank, it may need to be initialized and formatted before use. Follow the steps below in a Windows interface to initialize the drive.

1. From the main desktop or start menu, right-click on "Computer" ("My Computer" in XP), then select "Manage."
2. In the new Computer Management window, select Disk Management from the left window panel.



3. A dialog window should automatically appear, asking you to initialize the drive. Depending on the version of Windows, it will give you the option of either creating an "MBR" or "GPT" disk. GPT (GUID partition) is not compatible with some older operating systems, while MBR is supported by newer and older operating systems.
4. Once initialized, locate the Disk that says it is "Unallocated" (check the listed hard drive capacity to confirm it's the correct hard drive) and then right-click in the section that says "Unallocated" and select "New Simple Volume" ("New Partition" in XP).



5. Follow the on-screen prompts to initialize the drive in the format of your choice.

Port Multiplier

Port Multiplier (PM) allows for multiple SATA drives (up to 4) to be connected to a single SATA host port. PM allows for easy, cost-effective storage scalability both inside and outside the PC or server. It is commonly used to connect a multi-drive SATA/eSATA hard drive enclosure/backplane using a single cable. This greatly expands the storage capabilities of the SATA controller beyond its normal port count. Please visit StarTech.com for more SATA controllers that support the Port Multiplier feature.

Note: Only the three SATA ports can use the Port Multiplier feature. Only one of these SATA ports can use the Port Multiplier feature at a time. The card supports up to 4 drives connected via Port Multiplier, and 7 drives total (including a mSATA SSD).

Mac OS does not support Port Multiplier.

Operation

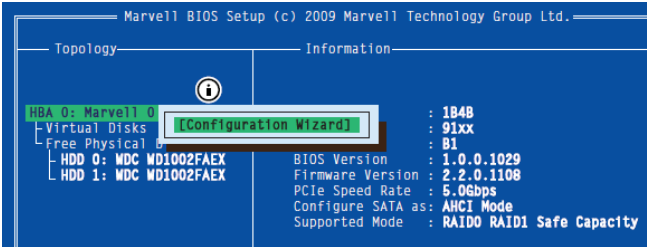
RAID Configuration

Card BIOS Method

WARNING! Creating a RAID virtual disk destroys all data on the physical disks included in the virtual disk set. Make sure to back up all data before continuing.

1. When prompted on startup, press **Ctrl+M** to enter the card BIOS utility

2. Using the arrow keys to navigate, move to "HBA0: Marvell 0" and press **Enter** to select
3. Press **Enter** again to open the Configuration Wizard



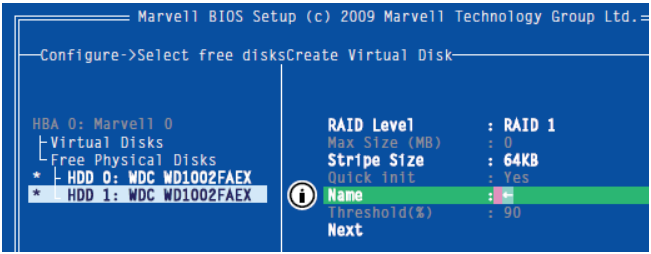
4. Use the arrow keys to scroll through the list of free physical disks to select the drives that will be part of the RAID set. Press Space to select/de-select a disk.

   NOTE: When a disk is selected, an asterisk (*) appears to the left of the disk label.

5. After selecting the required disks, press Enter to continue.

1. The "Create Virtual Disk" configuration options appear in the "Information" pane (right-side), here you are able to select the RAID level and other configuration options:

   a. Select 2 HDDs for RAID 0 or RAID 1
   b. Select 3 HDDs for RAID 0
   c. Select 4 HDDs for RAID 0 or RAID 10

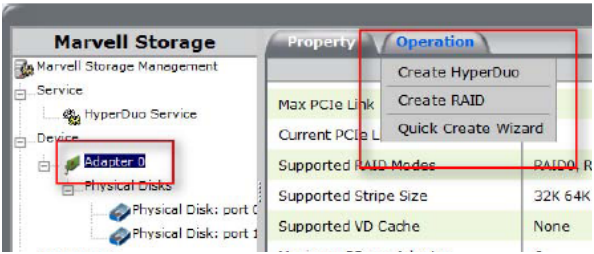


2. After configuring the virtual disk, highlight "Next" and press Enter. Press Y to confirm the creation of the virtual disk. It will now be listed in the Topology Pane (left).

Administration Console Method

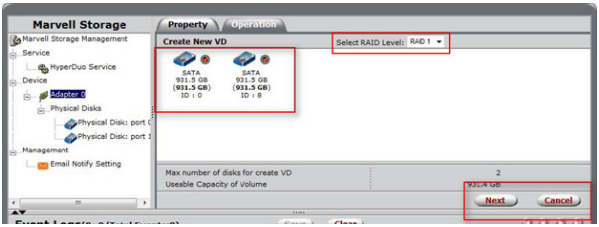
WARNING! Creating a RAID virtual disk destroys all data on the physical disks included in the virtual disk set. Make sure to back up all data before continuing.

1. From the left pane of main screen of the Marvell Storage Utility (MSU), select the adapter and hover the mouse over the "Operation" tab.
2. Select "Create RAID"

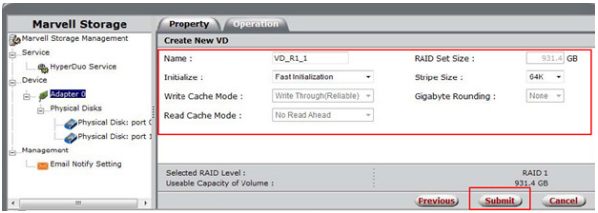


3. From the "Create new VD" screen that appears, click the "Select RAID Level" drop-down to choose the appropriate RAID type

4. This will enable you to place a checkbox beside the disks that you would like to use as part of the RAID set. Once you have selected, click "Next" to confirm your selection.



5. You will now be presented with configuration options for your RAID set. Choose the appropriate options and select "Submit" to confirm your changes. Your virtual disk will then be visible in the left pane – the same properties can be accessed later by selecting your virtual disk from the left pane.



HyperDuo Configuration

HyperDuo offers the following two modes that you can configure using either of the procedures outlined in the following sections:

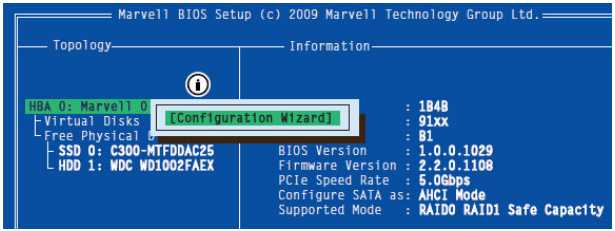
- Safe mode creates a virtual disk that is optimized for best fault tolerance – the frequently accessed files copied to the SSD for performance are also stored on the HDD. It is safe to use with hard drives that contain existing data. Virtual disks created in safe mode can also be partially rebuilt if the SSD fails, but not if the HDD fails.
- Capacity mode creates a virtual disk that is optimized for maximum utilization of the SSD – the frequently accessed files are moved to the SSD (not copied). Virtual disks created in capacity mode have better read and write performance than those created in safe mode. However, they cannot be rebuilt.

WARNING! Capacity mode is a data-destructive process. Please back up all data before using capacity mode.

Card BIOS Method

1. When prompted on startup, press Ctrl+M to enter the card BIOS utility

2. Using the arrow keys to navigate, move to "HBA0: Marvell 0" and press **Enter** to select
3. Press **Enter** again to open the Configuration Wizard



4. Use the arrow keys to scroll through the list of free physical disks to select the drives that will be part of the HyperDuo set. Press Space to select/de-select a disk.

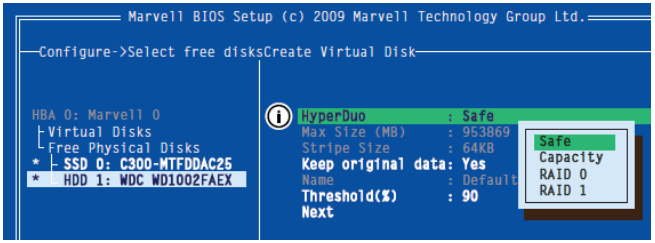
   NOTE: When a disk is selected, an asterisk (*) appears to the left of the disk label.

5. After selecting the required disks, press Enter to continue.
6. The "Create Virtual Disk" configuration options appear in the "Information" pane (right-side), here you are able to select HyperDuo or RAID options

   NOTE: The default HyperDuo mode is Safe mode.

7. Highlight "Keep original data" and press Enter to select. Select Yes or No and press Enter.

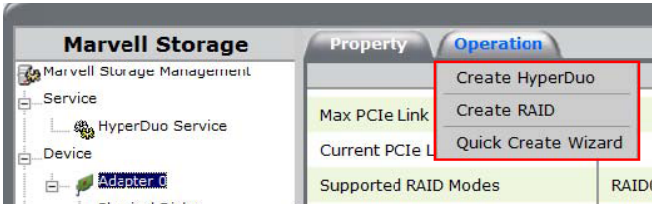
   WARNING! Selecting "No" will destroy all data on the disks included in the virtual disk set. Make sure to back up all data before continuing. The "Keep original data" option is disabled when you choose Capacity mode, as it is inherently data-destructive.



8. After configuring the virtual disk, highlight "Next" and press Enter. Press Y to confirm the creation of the virtual disk. It will now be listed in the Topology Pane (left).

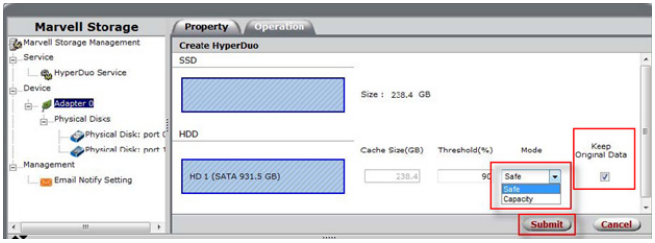
Administration Console Method

1. From the left pane of main screen of the Marvell Storage Utility (MSU), select the adapter and hover the mouse over the "Operation" tab.
2. Select "Create HyperDuo"

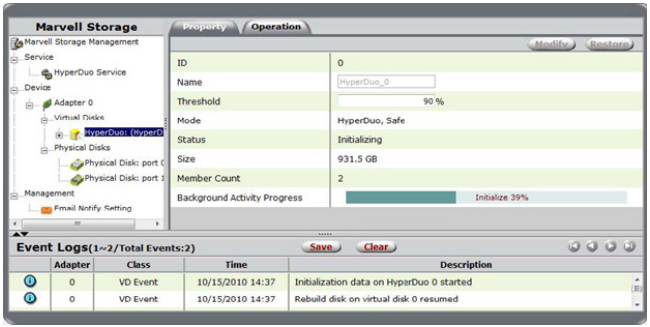


3. Select either Safe mode or Capacity mode from the drop-down in the right pane. Click the "Submit" button once you have selected the appropriate options for your operation.

   NOTE: If Safe mode is selected, you will have the option to select the checkbox marked "Keep Original Data" – this option is NOT available in Capacity mode, as it is inherently data-destructive.

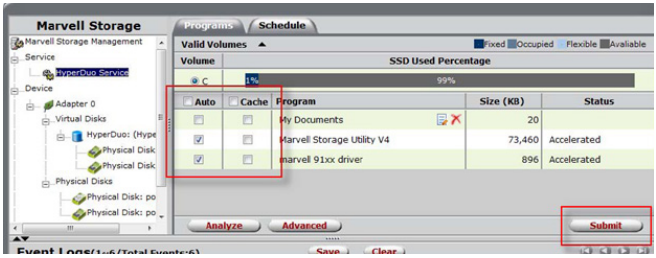


The newly created HyperDuo drive will then appear in the left pane and begin initializing. This can take up to 30 minutes to complete, and system performance may be slow during this period.

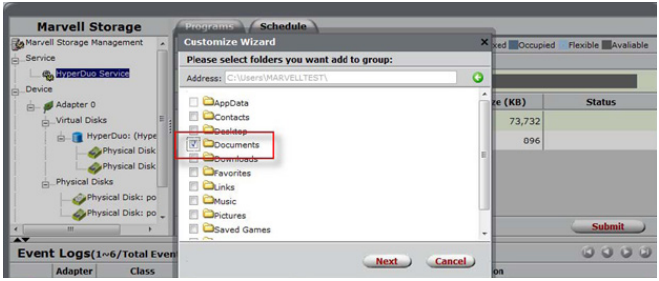


HyperDuo Management

1. From the left pane of the MSU, select “HyperDuo Service”
2. The right pane will then display available programs and folder that you can customize to one of the following optimization modes:
   a. Check Auto to have the MSU manage the optimization of a folder or program automatically.
   b. Check Cache to manually select a folder or program for optimization.
   c. Check neither to specify that a folder or program should never be optimized.



3. Select Submit to apply your changes, then select "OK" on the pop-up that follows.
4. If the folder you would like to optimize is not available, select "Advanced" from the "HyperDuo Service" pane.
5. The "Customize Wizard" will pop-up and allow you to select the desired folders.



Specifications

Host Interface	PCI Express 2.0 SATA Revision 3.0
Card Profile	Standard Profile (LP bracket incl.)
Chipset ID	Marvell 9230
Internal Connectors	3x 7-pin SATA plug 1x 52 pin mSATA slot
Maximum Transfer Rate	SATA: 6Gbps
RAID Support	RAID 0, 1, 1+0
Port Multiplier	Yes
Operating Temperature	5°C to 50°C (41°F to 122°F)
Storage Temperature	-25°C to 70°C (-13°F to 158°F)
Humidity	20-80% RH
Dimensions (LxWxH)	115mm x 20mm x 120mm
Weight	55g
Compatible Operating Systems	Windows® 8.1 (32/64bit), 8 (32/64bit), 7 (32/64), Vista (32/64), XP (32/64), Windows® Server 2012, 2008 R2, 2003, Mac OS 10.6 and up (Tested up to 10.9), Linux®

*Port Multiplier is not supported in Mac OS

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For the latest drivers/software, please visit **www.startech.com/downloads**

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